

IN THE DRAWINGS:

Please replace Figure 7 with the attached replacement sheet 1 illustrating new Figure 7. No new matter is presented.

REMARKS

Claims 1-40 are currently pending in the application. Claims 25 and 36 are amended. New Figure 7 is submitted. Claims 32-35 are allowed. No new matter is presented. Claims 1, 2, 3, 4, 6, 16, and 25 stand rejected under 35 U.S.C. §102(b). Claims 5, 10, 11, 12, 13, 14, and 36 are rejected under 35 U.S.C. 103(a). Applicants acknowledge the Examiner for indicating that claims 7-9, 15, 17-24, 26-31, and 37-40 contain allowable subject matter. However, the above-indicated rejections are respectfully traversed. The above amendments and the following remarks are considered by Applicants to overcome each rejection raised by the Examiner and to place the application in condition for allowance. An early Notice of Allowance is therefore requested.

I. Amendments to the Drawings and Specification

The specification is amended to more clearly describe the features of the claimed invention. The drawings are also amended. Specifically, new figure 7 is submitted. Figure 7 is amended to illustrate the non-conductive areas 37f of each proper common electrode 37. The basis for the amendments to the drawings and the specification is provided by the recesses of each proper common electrode 37. Therefore, it is submitted that no new matter is presented.

II. Rejection of Pending Claims 1, 2, 3, 4, 6, 16 and 25 Under 35 U.S.C. § 102(b)

Claims 1, 2, 5, 9, and 10 are rejected as being anticipated by Takagi et al. (U.S. Patent Publication 2002/0024567). In view of the above amendments, Applicants request the withdrawal of the rejection of claims 1, 2, 3, 4, 6, 16, and 25.

A. Relevant Law

"A claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference." *Bristol-Myers Squibb v. Ben Venue*, 246 F.3d 1368, 1374 (Fed. Cir. 2001). Identity of invention requires that a prior reference disclose to one of ordinary skill in the art all elements and limitations of the patent claim. *Scripps Clinic*

v. Genentech, 927 F.2d 1565, 1576 (Fed. Cir. 1991). Absence from the reference of any claimed element negates anticipation. *Kloster Speedsteel AB v. Crucible, Inc.*, 230 USPQ 81 (Fed. Cir. 1986).

B. Summary of Cited References

Takagi discloses an ink impermeable and an electrically insulative adhesive sheet that is pasted to the lower surface of a piezoelectric actuator, which is constructed by laminating alternately a piezoelectric sheet with individual electrodes and piezoelectric sheet with a common electrode. Takagi also discloses a top sheet 23 of a plurality of piezoelectric sheets having through holes such that surface electrodes 30 communicate with the aligned individual electrodes 23 and dummy individual electrodes 26. The through holes 33 are formed at the four corners such that the surface electrodes 31 on the top sheet 23 communicate with the aligned lead portions of each common electrode and the aligned dummy common electrodes

C. Argument

The Examiner asserts that Takagi teaches all the features recited in claims 1, 2, 3, 4, 6, 16, and 25. Applicants respectfully disagree.

The Examiner indicates that Takagi discloses that the plurality of external pads 31 are the same as the external pads as recited in claim 1. Applicants respectfully disagree. In contrast to Takagi, the external pads recited in claim 1 are electrically connected to the individual electrodes (elements 24 of Takagi, Figs. 5 and 6) via the internal leads (elements 32, 26 of Takagi), the elements 30 of Takagi correspond to the external pads recited in claim 1. Elements 31 of Takagi are electrically connected to a common electrode 25 via elements 33, 27, as shown in Fig. 5. Thus, Takagi does not disclose a plurality of external pads as provided in the claimed invention.

The Examiner also refers to on line 12 of page 3 of the office action, to elements “30, Fig. 2” of Takagi as a plurality of internal leads recited in claim 1. It should be noted that the internal leads recited in claim 1 electrically connect between the individual electrodes (elements 24 of Takagi) and the external pads (elements 30 of Takagi). Therefore it is respectfully submitted elements 30 do not correspond to the internal leads as provided in the claimed invention.

Furthermore, Takagi states, in paragraph [0053], that individual electrodes 24 are formed in rows along the longer side direction so as to be aligned with the respective pressure chambers 16 in the cavity plate 10. It is also stated that that surface electrodes 30 are provided along the longer side edges so as to be aligned with the respective individual electrodes 24 and dummy individual electrodes 26. (See Paragraph [0059]). Takagi further states that [b]y filling the through holes 32, 33 with a conductive material, the individual electrodes 24, the dummy individual electrodes 26, and the surface electrodes 30, which are aligned with each other in the laminating direction, are electrically connected (See Paragraph [0061]). Finally, Takagi states, in paragraph [0072], that a flexible flat cable 40 is pressed ... onto the upper surface of the top sheet 23, and various wiring patterns (not shown) are electrically connected to each of the surface electrodes 30, 31. In other words, Takagi indicates that the surface electrodes 30 of Takagi, i.e., the external pads are aligned with the respective pressure chambers 16 in the laminating direction. However, Takagi fails to teach or suggest the subject matter of claim 1, i.e., locating a plurality of external pads, on the outer surface of the outermost sheet member of the piezoelectric actuator, at respective positions that are at least partially aligned with a plurality of partition walls each of which is located between corresponding two pressure chambers of a plurality of pressure chambers in a reference direction in which a plurality of nozzles are arranged. Thus, it is respectfully submitted that Takagi fails to teach or suggest all the features recited in the rejected claims. Accordingly, Applicants request the withdrawal of the rejection of claim 1 under 35 U.S.C. 102(b).

Claims 2, 3, 4 and 6 are dependent upon claim 1. Therefore, it is submitted that claims 2, 3, 4, and 6 recite subject matter that is neither taught nor suggested by the cited reference. Accordingly, Applicants request the withdrawal of the rejection of claims 2, 3, 4, and 6.

With regard to claim 16, the Examiner states, on the last five lines of page 6 of the office action, that each of the first internal pads (26, Fig. 5) (of Takagi) ... extends in a third direction inclined by a first predetermined angle relative to the second direction. Applicants respectfully disagree with this analysis.

It should be noted that the second direction is perpendicular to the first direction in which nozzles 15 of Takagi are arranged. As clearly shown in Fig. 5, each first internal pad 26, shown in Fig. 5, extends in the second direction perpendicular to the first direction in which the nozzles 15 are arranged. However, Takagi fails to teach or suggest the subject matter of claim 16, i.e., employing a plurality of first internal pads (e.g., elements 38 shown

in Fig. 17 of the Applicant's case) each of which extends in a third direction inclined by a first predetermined angle (e.g., angle \square shown in Fig. 17) relative to the second direction. Thus, in view of these distinctions, Applicants request the withdrawal of the rejection of claim 16 under 35 U.S.C. 102(b) over Takagi.

With regard to claim 25, the Examiner states, on the last two lines of page 7, and the first five lines of page 8, of the office action, that said at least one common electrode (25, Fig. 5) [includes] a plurality of first electrically conductive portions (material filled in each through hole 32, Fig. 5) each of which at least overlaps a corresponding one of the pressure chambers (16, Fig. 3), and is elongate in the second direction, and additionally [includes] at least one second electrically conductive portion (30, Fig. 2) which extends in the first direction to connect respective one ends of the first conductive portions. Applicants disagree with the Examiner's analysis.

First, the Examiner refers to the material filled in each through hole 32, as each of the first conductive portions of the common electrode 25. However, since the common electrode, recited in claim 25, is one of the sheet members that are stacked on each other, the common electrode does not include any portions filling the through holes formed through the thickness of the piezoelectric sheet as another sheet member. Thus, the common electrode 25 of Takagi does not include the first conductive portions recited in claim 25 (e.g., conductive portions 37d and/or non-conductive portions 37f shown in Fig. 7 of the Applicant's case).

Second, the Examiner refers to element 30, Fig. 2 as the second conductive portion of the common electrode 25. However, the common electrode 25 is provided on each of the piezoelectric sheets 21g, 21e, 21c, 21a, whereas the element (surface electrode) 30 is provided on only the top piezoelectric sheet 23. Thus, the common electrode 25 does not include the element 30. That is, the common electrode 25 of Takagi does not include the second conductive portion recited in claim 25 (e.g., conductive portions 37a, 37b, 37c shown in Fig. 7 of the Applicant's case), either. In other words, Takagi fails to teach or suggest employing a common electrode recited in claim 25. Therefore, Applicants request the withdrawal of the rejection of claim 25 under 35 U.S.C. 102(b).

III. Rejection of pending claims 5, 10, 11, 12, 13, 14, and 36 Under 35 U.S.C. 103(a) as being unpatentable over Takagi in view of Qui et al. (U.S. Patent No. 6,142,615).

Claims 5, 10, 11, 12, 13, 14, and 36 are rejected as being unpatentable over Takagi in view of Qui et al. (U.S. Patent No. 6,142,615). This rejection is overcome in view of the above amendments and the following remarks.

A. Summary of Cited Reference

Qui discloses a piezoelectric device for an ink jet print head that has a greater displacement at a low drive voltage. Qui further discloses piezoelectric device 4A corresponding to a cavity 21A and a piezoelectric device 4B corresponding to cavity 21B.

B. Argument

It is respectfully submitted that Qiu fails to cure the deficiencies of Takagi. More specifically, Qiu discloses, in Fig. 5, an ink-jet recording head including a plurality of pressure or ink chambers 21A, 21B, and a plurality of piezoelectric devices 4A, 4B that are aligned with the ink chambers 21A, 21B, respectively. However, Qiu does not teach or suggest employing any external pads, recited in claim 1 of the present application, or locating those external pads at respective positions that are at least partially aligned with a partition wall 22 located between the ink chambers 21A, 21B, in contrast to claim 1. Thus, since claim 5 is dependent upon claim 1, Applicants submits that claim 5 recites patentable subject matter. Therefore, Applicants request the withdrawal of the rejection of claim 5.

With regard to claims 10-14, the Examiner refers, on line 14 of page 9 of the office action, to elements 31 of Takagi as a plurality of external pads recited in claim 10. However, as mentioned above, Takagi does not disclose the external pads as recited claim 1. Also Fig. 5 shows that the elements (surface electrodes) 30 are electrically connected to individual electrodes 24 via elements 32, 26 as internal leads. In addition, the surface electrodes 30 are aligned with the individual electrodes 24, respectively, as explained above. See paragraph [0061] of Takagi. Since active portions are defined by sandwiching a plurality of portions of the piezoelectric sheet 21 (e.g., 21g) between the individual electrodes 24 and the common electrode 25, the surface electrodes 30 are aligned with the active portions, respectively. Thus, Takagi fails to teach or suggest locating one of the external pads 30 such that the one external pad 30 is more distant from a certain end of the piezoelectric actuator than a corresponding one of the active portions.

In addition, the Examiner states, in the last paragraph of page 10 of the office action, that Qui teaches the piezoelectric actuator comprising at least two actuator portions (4A and 4B, Fig. 5) each of which has a plurality of active portions (41 and 42, Fig. 1). Applicants respectfully disagree with this analysis. It is submitted that Qui fails to teach or suggest employing a piezoelectric actuator comprising at least two actuator portions each of which has a plurality of active portions and which are arranged next to each other in a reference

direction such that respective one ends of said at least two actuator portions are opposed to each other in the reference direction, and such that said at least two actuator portions are opposed to at least two groups of pressure chambers, respectively, each group of which consists of at least two pressure chambers arranged in the reference direction.

Thus, even if Takagi may be combined with Qui a person skilled in the art would not have been motivated to locate one of a plurality of external pads that is nearest to one end of one of a plurality of actuator portions that is opposed to one end of another actuator portion in a reference direction, such that said one external pad is more distant from said one end of said one actuator portion, than one of a plurality of active portions of said one actuator portion that is nearest to said one end. Therefore, it is submitted that the combination of the cited references fail to teach or suggest all the features recited in claims 10-14. In view of the above distinctions Applicants respectfully request the withdrawal of the rejection of claims 10-14 under 35 U.S.C. 103(a).

With regard to claim 36, the Examiner refers, on line 8 of page 13 of the office action, to element 21f of Takagi as at least one piezoelectric sheet, recited in claim 36, and additionally refers, on line 11 of page 13, to elements 25a of Takagi as a plurality of internal leads, recited in claim 36. Applicants traverse the rejection of claim 36.

The common electrode 25 is provided on each of piezoelectric sheets 21a, 21c, 21e, 21g, and elements (internal leads) 32 extend through the thickness of each piezoelectric sheet 21a through 21g, 23 so as to connect between individual electrodes 24 and internal pads 26. Each of the internal pads 26 extends in a second direction perpendicular to a first direction in which nozzles 15 are arranged, as shown in Fig. 5; and each of the individual electrodes 24 straightly extends in the second direction.

Thus, Takagi fails to teach or suggest the subject matter of claim 36, for example, (a) providing a plurality of internal pads each of which extends in a third direction inclined by a first predetermined angle relative to the second direction; or (b) providing a plurality of individual electrodes each of which includes an end portion which is inclined in a direction away from a certain end of the piezoelectric actuator.

The Examiner also states that Qui teaches the piezoelectric actuator comprising at least two actuator portions (4A and 4B, Fig. 5) each of which has a plurality of active portions (41 and 42, Fig. 1). Applicants disagree with this analysis for the same reasons as discussed above in connection with the rejection to claims 10-14. Furthermore, even if Takagi may be combined with Qui, a person skilled in the art would not have been motivated to (a) provide a plurality of internal pads each of which extends in a third direction inclined

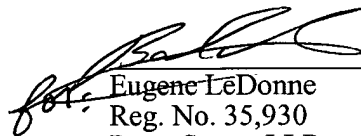
by a first predetermined angle relative to the second direction; or (b) providing a plurality of individual electrodes each of which includes an end portion which is inclined in a direction away from one end of one of a plurality of actuator portions that is opposed to one end of another actuator portion in the first direction. It is submitted that the cited references fail to teach or suggest the features recited in claim 36. Therefore, Applicants request the withdrawal of the rejection of claim 36 under 35 U.S.C. 103(a).

Claims 5, 11, 12, 13, and 14 are dependent upon claims 1 and 36. In view of the amendments to claims 1 and 10, Applicants respectfully requests the withdrawal of the rejection of claims 5, 11, 12, 13, and 14 under 35 U.S.C. 103(a).

IV. Conclusion

In view of the above amendments and remarks, Applicants submit pending claims 1-40 recite subject matter that is neither taught nor suggested by the applied references. Claims 25 and 36 are amended. No new matter is presented. Thus, by this amendment all pending claims are believed by Applicant to define patentable subject matter and should be passed to issue at the earliest possible time. A Notice of Allowance is requested.

Respectfully submitted,

 Reg. 50,900
Eugene LeDonne
Reg. No. 35,930
REED SMITH LLP
599 Lexington Avenue
New York, NY 10022
(P) 212-521-5402
Attorney for Applicant

BKS